



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/010,280	12/05/2001	Robert B. Ogle	M-7522 US	5067

7590 08/26/2002

Skjerven Morrill MacPherson LLP
Suite 700
25 Metro Drive
San Jose, CA 95110

EXAMINER

PIZARRO CRESPO, MARCOS D

ART UNIT	PAPER NUMBER
----------	--------------

2814

DATE MAILED: 08/26/2002

7

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/010,280	OGLE ET AL.	
	Examiner	Art Unit	
	Marcos D. Pizarro-Crespo	2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 June 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) 17-21 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 1-21 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>4</u> . | 6) <input type="checkbox"/> Other: _____ |

Art Unit: 2814

Attorney's Docket Number: M-7522 US

Filing Date: 12/5/2001

Claimed Foreign Priority Date: 12/6/2000 (Provisional 60/254,066)

Applicant(s): Ogle et al.

Examiner: Marcos D. Pizarro-Crespo

DETAILED ACTION

This Office action responds to the election (paper no. 6) filed on 6/19/2002.

Election/Restrictions

1. Applicant's election of claims 1-16 in paper no. 6 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).
2. Claims 17-21 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

5. Lines 5-6 of claim 1 recite the limitation "the silicon nitride". There is insufficient antecedent basis for this limitation in the claim.

6. Line 1 of claim 2 recites the limitation "the silicon nitride". There is insufficient antecedent basis for this limitation in the claim.

7. Line 1 of claim 3 recites the limitation "the silicon nitride". There is insufficient antecedent basis for this limitation in the claim.

8. Line 1 of claim 4 recites the limitation "the silicon nitride". There is insufficient antecedent basis for this limitation in the claim.

9. Line 1 of claim 5 recites the limitation "the silicon nitride". There is insufficient antecedent basis for this limitation in the claim.

10. Line 1 of claim 6 recites the limitation "the silicon nitride". There is insufficient antecedent basis for this limitation in the claim.

11. Line 1 of claim 7 recites the limitation "the silicon nitride". There is insufficient antecedent basis for this limitation in the claim.

12. Line 1 of claim 8 recites the limitation "the silicon nitride". There is insufficient antecedent basis for this limitation in the claim.

13. Line 1 of claim 9 recites the limitation "the silicon nitride". There is insufficient antecedent basis for this limitation in the claim.

14. Lines 6 of claim 10 recites the limitation "the silicon nitride layer". There is insufficient antecedent basis for this limitation in the claim.

15. Lines 6-7 of claim 10 recite the limitation "the silicon nitride". There is insufficient antecedent basis for this limitation in the claim.

16. Lines 8-9 of claim 10 recite the limitation "the pretreated silicon nitride layer". There is insufficient antecedent basis for this limitation in the claim.

17. Line 1 of claim 11 recites the limitation "the silicon nitride". There is insufficient antecedent basis for this limitation in the claim.

18. Line 1 of claim 12 recites the limitation "the silicon nitride". There is insufficient antecedent basis for this limitation in the claim.

19. Line 1 of claim 13 recites the limitation "the silicon nitride". There is insufficient antecedent basis for this limitation in the claim.

20. Line 1 of claim 14 recites the limitation "the silicon nitride". There is insufficient antecedent basis for this limitation in the claim.

21. Line 2 of claim 15 recites the limitation "the silicon nitride layer". There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

22. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

23. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Takeuchi (US 5661056).

24. Takeuchi shows all aspects of the instant invention including a method of forming a dielectric structure for a flash memory cell, the method comprising:

➤ forming a first layer of silicon dioxide (col.6/ll.39-40)

- forming a silicon nitride layer on the first layer of silicon dioxide (col.4/ll.36-37)
- pre-treating the silicon nitride layer including oxidizing the silicon nitride layer (col.4/ll.40-42)
- depositing a second layer of silicon dioxide on the pre-treated silicon nitride layer (col.4/ll.40-42)

Claim Rejections - 35 USC § 103

25. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

26. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

27. Claims 10, 15, and 16, are rejected under 35 U.S.C. 103(a) as being unpatentable over Hong (US 5445984) in view of Eitan (US 5966603).

28. Hong shows (see, e.g., fig. 2) most aspects of the instant invention including a method of making a flash memory cell including a substrate **20**, a tunnel oxide **22**, and a first polysilicon layer **24**, the method comprising:

- forming a first layer of silicon dioxide on the first polysilicon layer (col.6/ll.40-43)
- forming a silicon nitride layer on the first layer of silicon dioxide (col.6/ll.44-46)
- pre-treating the silicon nitride layer including oxidizing the silicon nitride layer (col.6/ll.47)

Hong also teaches that by oxidizing the silicon nitride layer a second layer of silicon dioxide is formed (col.6/ll.46). Alternatively, this second layer of silicon dioxide may be formed by deposition (col.6/ll.47-49). By doing this, Hong completed his formation of integrated dielectric layer (ONO) 38. However, Hong fails to teach that deposition of the second silicon oxide layer is accomplished after oxidizing the silicon nitride layer.

As Hong, Eitan describes a method to form ONO layers and teaches that the top oxide layer within an ONO layer may either be formed through an oxidation of the nitride layer or by deposition (col.3/ll.51-53). Eitan further teaches that forming the top oxide layer by a combination of the nitride oxidation and an oxide deposition is *an alternative operation* to either the nitride oxidation or the oxide deposition (col.3/ll.53). Ultimately, the process by which the top oxide layer is generated will depend on the ability of the manufacturing facility to control the thickness and composition of the layers of the ONO structure (col.4/ll.8-11).

Consequently, it would have been obvious at the time of the invention to one of ordinary skill in the art to oxidize Hong's nitride layer and subsequently deposit a second oxide layer on the oxidized nitride layer instead of forming the second oxide layer by either oxidizing the nitride layer or depositing an oxide layer, as taught by Eitan, since a method step combining the nitride oxidation and the oxide deposition is *an alternative operation* to either the nitride oxidation or the oxide deposition.

29. Regarding claim 15, Eitan shows the first silicon oxide layer may be 50 Å-thick (col.3/ll.45), the nitride layer may be 50 Å-thick (col.3/ll.57), and the second silicon oxide layer may be 50 Å-thick (col.3/ll.61).

30. Regarding claim 16, Hong shows (see, e.g., fig. 2) a second polysilicon layer **28** on the second silicon oxide layer.

Allowable Subject Matter

31. Claims 2-9 and 11-14 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Conclusion

32. Papers related to this application may be submitted directly to Art Unit 2814 by facsimile transmission. Papers should be faxed to Art Unit 2814 via the Art Unit 2814 Fax Center located in Crystal Plaza 4, room 3C23. The faxing of such papers must conform to the notice published in the Official Gazette, 1096 OG 30 (15 November 1989). The Art Unit 2814 Fax Center number is **(703) 308-7722** or **-7724**. The Art Unit 2814 Fax Center is to be used only for papers related to Art Unit 2814 applications.

33. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Marcos D. Pizarro-Crespo** at **(703) 308-6558** and between the hours of 8:00 AM to 4:00 PM (Eastern Standard Time) Monday through Friday or by e-mail via Marcos.Pizarro@uspto.gov. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri, can be reached on (703) 306-2794.

34. Any inquiry of a general nature or relating to the status of this application should be directed to the **Group 2800 Receptionist** at **(703) 308-0956**.

35. The following list is the Examiner's field of search for the present Office Action:

Field of Search	Date
U.S. Class / Subclass(es): 257/324; 438/216,261,287	8/16/2002
Other Documentation: PLUS Analysis	8/16/2002
Electronic Database(s): EAST (USPAT, EPO, JPO)	8/16/2002

EDDIE LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800



Marcos D. Pizarro-Crespo
Patent Examiner
Art Unit 2814
703-308-6558
marcos.pizarro@uspto.gov